Space Weather Forecast

Issued on Thursday, 22 August 2024 at 13:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Minor to Moderate flares likely, slight chance of Strong flares. Slight chance of G1/Minor Storms for Days 1-2 (22-23 Aug).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate, with two Moderate-class recorded in the last 24 hours, the peak flare from a large active region in the southeast at 21/2208UTC.
There are now eleven regions on the visible disc, including two unnumbered regions in the southeast. A large region now centre disc in the south has shown some consolidation and growth in its lead and trailer portions with that and a further large region in the southeast representing the bulk of the flare risk. The other sunspot regions are comparatively smaller or less complex, and either stable or in slight decay.

A filament (arc of plasma) lift-off near centre disc occurred around 21/1700UTC and may have produced a CME (coronal mass ejection) with an Earth directed component. Relevant coronagraph imagery is currently awaited in order to conduct a full analysis of this event although a significant Earth-directed component now looks unlikely.

Solar Wind / Geomagnetic Activity: The solar wind continued in a generally background regime, with speeds at slow-ambient throughout. The Interplanetary Magnetic Field, Bt, was weak to moderate. The important north-south component, Bz, varied weakly but was often southward directed. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate-class flares are likely during the period with a slight chance of Strong flares.

Solar Wind /Geomagnetic Activity: The geomagnetic forecast is of lower-than-average confidence in detail for this period. Faster solar winds likely into later Day 1 (22 Aug), perhaps combining with a CME from 17 August, although this is very low confidence. Solar winds likely increasing towards slightly elevated or elevated levels around 450-500km/s, with this fast wind influence slowly declining through Day 2 into Day 3 (23-24 Aug).

Geomagnetic conditions are expected to be largely quiet to unsettled (Kp2-3) but with active (Kp4) intervals likely at times and a slight chance of isolated G1/minor storm intervals should we see any significant fast wind influence.

Energetic Particles / Solar Radiation: Solar radiation is likely to persist at background levels, however there is a chance of exceeding the S1/Minor solar radiation storm level should any notable flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	65	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	5	5	5	5

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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